

Technical data Part-turn actuators for open-close and modulating duty

Type	Operating time for 90° in seconds (adjustable in 9 steps) <sup>1)</sup>			Torque range <sup>2)</sup>	Run torque/ modulat- ing torque <sup>3)</sup>	Valve attachment	Valve shaft			Handwheel		Weight <sup>4)</sup>
	18 W	25 W	50 W				Max. [Nm]	Max. [Nm]	Standard EN ISO 5211	Cylindric- al max. [mm]	Square max. [mm]	
80	16 – 160	8 – 80	4 – 40	32 – 80	40	F05/F07/F10	20	17	17	100	20.2	8
150	32 – 320	16 – 160	8 – 80	60 – 150	75	F05/F07/F10	20	17	17	100	20.2	8
300	63 – 320	45 – 320	22 – 160	120 – 300	150	F07/F10	38	30	27	160	16.3	11
600	—	75 – 320	45 – 320	240 – 600	300	F07/F10	38	30	27	160	16.3	11

- 1) The values for operating times refer to an operation across 90° of travel at a load of 70 % of the maximum torque
- 2) The "Torque by-pass" function (can be activated) allows increasing the pre-set torque to 130 % (unseating torque). This increase only applies during actuator start for an adjustable time period allowing to unseat blocked valves.
- 3) Maximum permissible torque for modulating duty
- 4) Specified weight includes part-turn actuator, unbored coupling and handwheel.

Features and functions		
Type of duty	Open-close duty	Classes A and B according to EN 15714-2, short-time duty S2 - 15 min
	Modulating duty	Class C according to EN 15714-2, intermittent duty S4 - 50 %, with maximum number of starts <ul style="list-style-type: none"> <li>• PF-Q80 – PF-Q150: 1,200 starts / hour</li> <li>• PF-Q300 – PF-Q600: 1,200 starts / hour</li> </ul>
	For nominal voltage and +40 °C ambient temperature and at run or modulating torque load. The type of duty must not be exceeded.	
Motor	Variable speed, brushless motor	
Insulation class	F, tropicalized	
Motor protection	Via calculated temperature value	
Self-locking	Yes, at standstill with spring-applied brake	
Swing angle	With mechanical end stops (option)	
	Standard:	90° ±15° adjustable between min. and max. values
	Option:	120 ±15° adjustable between min. and max. values
	Without mechanical end stops	
Standard	45° – 360° adjustable between min. and max. values	
Limit switching	Via hall sensors	
Torque switching	Via electronic current measurement. Tripping torques adjustable in 8 steps	
Mechanical position indicator (option)	Continuous indication, for 90° or 120° Via own markings at indication 45° – 360°	
Manual operation (option)	PF-Q80 – PF-Q600	Manual drive for setting and emergency operation, handwheel does not rotate during electrical operation
Coupling	Standard	Coupling unbored
	Options:	<ul style="list-style-type: none"> <li>• Coupling unbored extended</li> <li>• Finish machining of coupling (standard or extended)                             <ul style="list-style-type: none"> <li>- Bore according to EN ISO 5211 with 1 keyway according to DIN 6885-1</li> <li>- Square bore according to EN ISO 5211</li> <li>- Two-flat according to EN ISO 5211</li> </ul> </li> </ul>
Valve attachment	Dimensions according to EN ISO 5211	

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Power supply	Standard voltages: 1-phase AC current: 100 – 240 V / 50 – 60 Hz The voltage range may be exceeded or undercut by max. 10 % The frequency range may be exceeded or undercut by max. 5 % For current consumption, refer to Electrical data for PROFOX Part-turn actuators	
Overvoltage category	Category III according to IEC 60364-4-443	
Power electronics	With integral motor controller (current consumption in standby mode 3 W)	
Control (input signals)	Operation commands and setpoint via Profibus DP interface	
Status signals (output signals)	Via Profibus DP interface	
Profibus DP-V1 (option)	Access to parameters, the electronic name plate and the operating and diagnostic services with acyclic write/read services	
Voltage output (option)	Auxiliary voltage 24 V DC, max. 80 mA for supply of control inputs, without galvanic isolation.	
Functions	Standard: <ul style="list-style-type: none"> <li>• Switch-off mode adjustable: Limit or torque seating in end positions OPEN and CLOSED</li> <li>• Torque monitoring across the whole travel</li> <li>• Torque by-pass</li> <li>• Programmable EMERGENCY behaviour                             <ul style="list-style-type: none"> <li>- Digital input low active,</li> <li>- Reaction can be selected: Stop, run to end position CLOSED, run to end position OPEN</li> </ul> </li> <li>• Speed control                             <ul style="list-style-type: none"> <li>- Ramps</li> <li>- Programmable operation profiles</li> <li>- Specific speed for OPEN and CLOSE operation or one digital input can be programmed</li> </ul> </li> </ul>	
	Option: <ul style="list-style-type: none"> <li>• Positioner (for modulating actuators):                             <ul style="list-style-type: none"> <li>- Position setpoint via analogue input E1 = 0/4 – 20 mA or 0 – 10 V</li> <li>- Programmable behaviour on loss of signal</li> <li>- Automatic adaptation of dead band (adaptive behaviour selectable)</li> <li>- Selection between open-close duty and modulating duty via digital MODE input</li> </ul> </li> </ul>	
Bluetooth communication interface	Bluetooth class II chip, version 2.1: With a range up to 10 m in industrial environments, supports the SSP Bluetooth profile (Serial Port Profile). Required accessories: <ul style="list-style-type: none"> <li>• AUMA CDT (Commissioning and Diagnostic Tool for Windows-based PC)</li> <li>• AUMA Assistant App (Commissioning and Diagnostic Tool for Android devices)</li> </ul>	
Electrical connection	Cable gland: 3 x M20 and inside terminal rail for wire connection	
Wiring diagram (basic version)	Open-close duty	TPC P00A1A1A100000
	Modulating duty	TPC P00A1B1A100000

Setting/programming the Profibus DP interface	
Baud rate setting	Automatic baud rate recognition
Setting the Profibus DP interface	Profibus DP address is set via parameters (commissioning and diagnostic tools or AUMA Assistant App)

General Profibus DP interface data	
Communication protocol	Profibus DP according to IEC 61158 and IEC 61784-1
Network topology	<ul style="list-style-type: none"> <li>• Line (fieldbus) structure.</li> <li>• When using repeaters, tree structures can also be implemented</li> <li>• Coupling and uncoupling of devices during operation without affecting other devices is possible</li> </ul>
Transmission medium	Twisted, screened copper cable according to IEC 61158
Fieldbus interface	EIA-485 (RS485)

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Transmission rate/cable length	<ul style="list-style-type: none"> <li>Baud rate and maximum cable length (segment length) without repeater: <ul style="list-style-type: none"> <li>between 9.6 and 93.75 kbit/s: 1,200 m</li> <li>for 187.5 kbit/s: 1,000 m</li> <li>for 500 kbit/s: 400 m</li> <li>for 1,500 kbit/s: 200 m</li> </ul> </li> <li>Baud rate and possible cable length with repeater (total network cable length): <ul style="list-style-type: none"> <li>between 9.6 and 93.75 kbit/s: approx. 10 km</li> <li>for 187.5 kbit/s: approx. 10 km</li> <li>for 500 kbit/s: approx. 4 km</li> <li>for 1,500 kbit/s: approx 2 km</li> </ul> </li> </ul>
Device type	<ul style="list-style-type: none"> <li>DP master class 1, e.g. central controllers such as PLC, PC,....</li> <li>DP master class 2, e.g. programming/configuration tools</li> <li>DP slave, e.g. devices with digital and/or analogue inputs/outputs such as actuators, sensors</li> </ul>
Number of devices	32 devices without repeater, with repeater expandable to 126
Bus access	<ul style="list-style-type: none"> <li>Token-passing between masters and polling for slaves</li> <li>Mono-master or multi-master systems are possible.</li> </ul>
Supported fieldbus functions	Cyclic data exchange, sync mode, freeze mode, fail safe mode
Profibus DP ident no.	0x1146. Standard applications with Profibus DP-V0 and DP-V1

**Commands and signals of the Profibus DP interface**

Process representation output (command signals)	OPEN, STOP, CLOSE, position setpoint, RESET, EMERGENCY operation command
Process representation input (feedback signals)	<ul style="list-style-type: none"> <li>End positions OPEN, CLOSED</li> <li>Actual position value</li> <li>Selector switch in position LOCAL/REMOTE</li> <li>Torque switches OPEN, CLOSED</li> <li>Limit switches OPEN, CLOSED</li> </ul>
Process representation input (fault signal)	<ul style="list-style-type: none"> <li>Motor protection tripped</li> <li>Torque switch tripped in mid-travel</li> </ul>
Behaviour on loss of communication	<p>The behaviour of the actuator is programmable:</p> <ul style="list-style-type: none"> <li>Stop in current position</li> <li>Execute operation to end position OPEN and CLOSED</li> <li>Travel to any intermediate position</li> <li>Execute last received operation command</li> </ul>

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Operation and Display		
Basic at actuator	Status indication	FOX-EYE (indication LED) Status indications: OK, end positions, faults and "Bluetooth connection active".
	End position setting	4 buttons and 1 LED are located below the hood. Run actuator in directions OPEN and CLOSE. Set end position once mounted to the valve.
Smart via Bluetooth using AUMA Assistant App or AUMA CDT software	End position setting	Run actuator in directions OPEN and CLOSE. Set end position once mounted to the valve.
	Configuration	Basic settings for operation: <ul style="list-style-type: none"> <li>• Rotation speed</li> <li>• Type of seating for end positions, torque switching</li> <li>• Assignment of signal inputs and outputs</li> <li>• Fieldbus parameter (if fieldbus option has been selected)</li> <li>• etc.</li> </ul>
		Additional functions: <ul style="list-style-type: none"> <li>• For applications, safety and service, e.g.: <ul style="list-style-type: none"> <li>• Positioner</li> <li>• EMERGENCY behaviour</li> <li>• Torque by-pass</li> <li>• Failure behaviour</li> <li>• Signal configuration</li> <li>• etc.</li> </ul> </li> </ul>
	Diagnosics	Monitoring key figures and measured values for preventive maintenance and consequently increasing process safety. Limit values can be set. Deviations generate warning signals which can be transmitted to the DCS via binary outputs or fieldbus.
	Actuator	Temperature value within actuator Key figures regarding lifetime of electronics, brake, gearbox and seals.
	Actuator and valve:	Method for identifying changes in torque requirement: Perform reference operation and save torque as reference profile. Define tolerance range. Perform comparison operation if required. Values outside tolerance initiate a signal which is communicated as described above.
	Further key figures:	Furthermore, the actuator monitors and records further figures and conditions. The generated fault and warning signals are saved within the event log. These signals can be configured as requested. An overview in the AUMA Assistant App or the CDT software shows all available fault/warning signals with option to enter the details.

Service conditions		
Mounting position	Any position	
Installation altitude	≤ 2,000 m above sea level > 2 000 m above sea level on request	
Ambient temperature	–30 °C to +70 °C	
Humidity	Up to 100 % relative humidity across the entire permissible temperature range	
Enclosure protection according to EN 60529	Standard	IP67
	Option:	According to AUMA definition, enclosure protection IP68 meets the following requirements: <ul style="list-style-type: none"> <li>• Depth of water: maximum 8 m head of water</li> <li>• Duration of continuous immersion in water: Max. 96 hours</li> <li>• Up to 10 operations during continuous immersion</li> <li>• Modulating duty is not possible during continuous immersion</li> </ul>
Pollution degree according to IEC 60664-1	Pollution degree 4 (when closed), pollution degree 2 (internal)	
Vibration resistance according to EN 60068-2-6	2 g, from 10 Hz to 200 Hz Resistant to vibration during start-up or for failures of the plant. However, a fatigue strength may not be derived from this. Not valid in combination with gearboxes.	

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Corrosion protection	Standard: KS Suitable for use in areas with high salinity, almost permanent condensation, and high pollution.
	Option: KX Suitable for use in areas with extremely high salinity, permanent condensation, and high pollution.
Coating	Double layer powder coating Two-component iron-mica combination
Colour	Standard: AUMA silver-grey (similar to RAL 7037)
	Option: Available colours on request
Lifetime	Open-close duty: 10,000 operating cycles OPEN - CLOSE - OPEN An operating cycle is based on an operation from CLOSED to OPEN and back to CLOSED, at a respective rotary movement of 90°.
	Modulating duty: 1.8 million modulating steps
The lifetime depends on the load and the number of starts. A high starting frequency will rarely improve the modulating accuracy. To reach the longest possible maintenance and fault-free operating time, the number of starts per hour chosen should be as low as permissible for the process.	

Further information	
EU Directives	Electromagnetic Compatibility (EMC): (2014/30/EU) Low Voltage Directive: (2014/35/EU) Machinery Directive: (2006/42/EC)
Reference documents	Dimensions PROFOX PF-Q80 – PF-Q600 Electrical data PROFOX PF-Q80 – PF-Q600